

Title: Method of producing an inorganic cured product

A method of producing an inorganic product by adsorbing a cationic water repellent to pulp dispersing in water, mixing it with a hydraulic material to prepare a slurry and curing and setting the slurry under molding.

In the present invention, the pulp is used by treatment with a dispersant. As the dispersant, paper sizing agents, resins and their emulsion as cationic ones can be used. Any dispersants can be used in principle, which include a cationic group in their structure and have water-repellency. Among them, petroleum resin sizing agents and acrylic cation emulsions are suitable. The examples of them are follows:

$$\left[\left(\text{C}_6\text{H}_4 \right)_m \left(\text{C}-\text{C} \right)_n \right]_x \left[\text{O}-\text{C} \left(\text{C}_6\text{H}_4 \right)_m \text{C}-\text{O} \right]_y$$
$$\text{RCOHNCH}_2\text{CH}_2\left\{\overset{\text{HC}\equiv}{\underset{\text{CH}_2\text{CHCH}_2\text{C}\equiv}{\text{N}^+-\text{CH}_2\text{CH}_2-\text{N}^+}}\right\}_n\text{CH}_2\text{CHNHCO}\text{R}$$
$$\left[\begin{array}{c} \text{HCN, CH}_2\text{NHCOR} + \text{CONHCN, CH}_2\text{N} \\ | \\ \text{R} \end{array} \right]_n \begin{array}{c} \text{CH}_2\text{CH}-\text{CN} \\ \diagup \quad \diagdown \\ n \end{array}$$

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First, the dispersant is adsorbed to pulp by dispersing pulp in water after crushing, mixing the water repellant with the pulp slurry. Under such condition the pulp is dispersed in water, the cationic dispersant can act uniformly to the pulp and can be easily adsorbed to the pulp surfaces so that the water repellant treatment can be efficiently carried out. Next, this pulp slurry after the treatment using the water repellant is mixed with a hydraulic material such as cement or gypsum and, if necessary, additives to prepare a slurry for molding. The slurry is molded as a sheet by a paper-forming method and the sheet is further molded under pressure, cured and set and dried to form a pulp-reinforced inorganic cured product.

Regarding the inorganic cured product as obtained as above, since the pulp is treated with the water-repellant, the water-repellant can prevent absorption of water by the pulp when the inorganic cured product adsorb water and the strength reduction of the inorganic cured product can be lowered at water-absorption.

The present invention is further explained by the example.

Example

After pulp (LUKP, NUKP) was added to water at a concentration of 4 wt.% and rushed for 4 min in a mixer, a water repellant was added and the mixture was stirred for 3 min. to adsorb and fix the water repellant to the pulp. Next, the mixture was mixed with Portland cement, blast furnace water-crushed slug, gypsum, calcium carbonate and water so that the slurry concentration became 6 wt.% to obtain a slurry for molding by stirring for 2 min. A cake of 13 mm of thickness was prepared by filtering the slurry through a rectangular filter of 300 x 300 as an enlarged planer filter. This cake was molded under pressure of 20kg/cm² to obtain a row plate of 10 mm of thickness having a water content of about 35% (water/(solid part+water)). This row plate was cured in dump for 3 days at 80 °C and then dried in a dryer for about 10 hours at 80 °C. Thus, an inorganic cured product was obtained.

[Table 1]

Material Name	Combined Amount (Weight Parts)
Portland Cement	31
Blast furnace water-crushed slug	46
Gypsum	5
Pulp (LUKP)	4
Pulp (NUKP)	4
Calcium carbonate	10